

Somaesthetics in Design

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ABSTRACT

Somaesthetics is first and foremost a multidisciplinary perspective on how to work with our bodily experiences for the sake of improvement and creating aesthetics. Somaesthetics in design represent a strong first-person strategy, somatic training and dynamic working methods. Soma-based design theory is the term which relates to the practical, pragmatic and analytical inquiry of designing through the first-person perspective of the soma, and is a well adapted strategy to movement-based interaction design. Aspects of working with soma-based strategies may involve interplaying with perspectives, engaging in bodywork, physically interacting with the environment on multiple levels of consciousness and working with abstract articulations.

KEYWORDS: Human-Computer Interaction, User Experience, Soma-Based Design, Pragmatism, Aesthetics, Design for Movement, Research through Design, Somaesthetics

1. INTRODUCTION

Technology is embedded in our lives on several levels and we are in need of tools to steer the development of future technologies. Somaesthetics is fundamentally a phenomenological toolbox for working with embodied experiences for the sake of improvement and aesthetics. Simply explained, somaesthetics is the unification of somatics with aesthetics, and describes embodied ways of perceiving aesthetics. With its roots in philosophical pragmatism, it teaches a strong first-person, movement-based perspective to interaction, and has a broad outreach to many disciplines. It encourages intuition, movement, feeling and experimentation during the developmental processes, while simultaneously working as a holistic platform for knowledge about embodiment.

Understanding somaesthetics and its relevance to human-computer interaction (HCI) is an intricate

process, as it is duly noted that only a portion of somaesthetic phenomenology is based on written theory. The first step towards practicing is to learn the basics, and this article serves to briefly explain and articulate useful aspects of soma-based design. Somaesthetic aspects in design may also be referred to as soma-based interaction or soma-based design theory (Höök et.al 2018).

This article reviews and describes literature on somaesthetics and soma-based design in three parts. Firstly, somaesthetics and relevant aspects for soma-based design theory are introduced. Secondly, practical methods are described. Thirdly, the framework is discussed. In other terms, this article attempts to divide the content analytically, practically and pragmatically.

2. SOMAESTHETICS AND SOMA-BASED DESIGN THEORY

2.1 Background

Somaesthetics is a phenomenological concept sprung by pragmatist and philosopher Richard Shusterman through the framework of Merleau-Ponty. It supports that perception of beauty is subjectively mediated through the soma (lived body), and through meliorative theory and practice we can aid our understanding and awareness of our embodied experiences in the world. Different levels of somatic consciousness, he continues, can be usefully deployed in contexts of learning (Shusterman 2011).

Central to somaesthetics lies the use of the word 'soma'. Our soma feeds us all levels of perception and describes our existence as a compound entity made out of several factors, e.g society, body, mind, and environment. The soma, he describes, 'denotes not mere physical body but the lived, sentient, intentional, body that involves mental, social, and cultural dimensions (Shusterman 2011). 'Soma' conveniently also neglects negative connotations to the body which also may include stereotypes of appearance, function and such. Another important note is that the soma (in somaesthetic terms) is that it is a mouldable entity that dynamically forms over the discourse of time and experience (Shusterman 2018b), and therefore is uniquely individual and sentient in its own way. This pragmatic (but dynamic) approach to the human body fills important gaps in academic research on embodiment and interfaces by attributing practicality, aids multidisciplinary approaches and helps us understand perception of pleasure and beauty.

The greek word soma is used in similar fashion to the German word 'Leib' which has been translated and used by Merleau-Ponty through its origin in German philosophy as an expression for 'the lived body'. The Leib is an active body and manifests itself by possibilities of acting. 'Körper' in German is the word for the body in which the 'mind' is, and is strictly a functioning organism (Svanæs 2013).

Merleau-Ponty and Shusterman give priority to the Leib over the Körper, and they are similarly dedicated to fighting the body-mind dualism;

'It is as living bodies that we exist in the world' and 'The body is our general medium for having a world' (Merleau-Ponty 1962 p.283 in Svanæs 2013)

'For the body is our indispensable tool of tools, the necessary medium of our being, perception, action and self-presentation in the world.'

(Shusterman 2018a)

Somaesthetics also bring somatic aspects back to aesthetics, emphasising physical perception and experiences to define aesthetics (Kallio 2003). Shusterman's work may be seen as a practical continuation to Merleau-Ponty's phenomenology, as philosopher Shaun Gallagher puts it;

'Merleau-Ponty is telling us how we form habits (some of which may in fact be bad); Shusterman is giving us the means to reform and cure them.' (Gallagher 2011 p.311 in Shusterman 2011)

As illustrated in Figure 1, Shusterman categorises somaesthetics into three structural branches, which in some cases overlap each other (Shusterman 2018a):

- Analytic somaesthetics; explaining the nature of our bodily perceptions and practices, and their role in our knowledge and construction of the world.
- Pragmatic somaesthetics; exploring specific methods of somatic improvement and their comparative critique.
- Practical somaesthetics; disciplined bodywork aimed for somatic improvement.

Along with the branches are the three dimensions of somaesthetics:

- Representational; emphasis on the body's external appearance
- Experiential; focuses on the aesthetic quality of 'inner' bodily experiences (e.g. Yoga)
- Performative; emphasises power of performance (e.g. athletics)



Figure 1: Diagram of the different branches and dimensions of somaesthetics and of their interrelations, designed by Richard Shusterman and Hyijin Lee (Shusterman 2018a)

2.2 Relevance to design of user experiences and user-centred design

Aesthetics in HCI has often been neglected, considered secondary to usability or not included to be as relevant to the user experience as in other designs (e.g. product design). The interest for aesthetics in HCI is however coming to a noticeable rise (Kallio 2003, Lim 2007) and being noticed as valuable for commercialising uniqueness and difference between similarly functioning products. Aesthetics in user experience may also be highly relevant for adapting habits and behavioural choices, because past choices we have made leave traces in our experiences, and which decisions we will perform in the future (Kallio 2003).

While it has been overly focused on usability when designing digital user interfaces (UI) in the past, an increasing amount of solutions are becoming movement-based, engaging physical activity and technology through integrating play and social activity (e.g. wearables, mobile devices, augmented or virtual displays, 4d cinema, escape rooms, kinect games etc.). Most exergaming activities are still however labeled down to quantifiable measurements (Höök et. al. 2018a), and designing for free body movement is a great challenge without overly simplifying it (Sundström et.al 2011 and Mueller 2018a).

Apart from aesthetics do we also encounter e.g. challenges with including secondary users and working with conflicting user interests when designing HCI (Alsos and Svanæs 2011). There is a broad consensus for how a user-centered design process can be conducted (Svanæs and Gulliksen 2008), which highlights the potential for new strategies for creating authentic user experiences in HCI.

As movement-based interaction design is becoming increasingly popular, somatic practises are becoming more relevant as they take a place in both the process and the end result. The theory of soma-based design proposes practical, analytical and pragmatic study to understand the felt dimensions which are activated in the product (Höök et.al. 2017). Results of papers and workshop summaries from CHI2016 attended by prominent researchers in the HCI field show that movement-based design with a specific focus on aesthetics is being established:

‘Somaesthetically inspired design in HCI is reaching critical mass and we can start to describe classes of systems with different characteristics as well as important topics arising in and through this design work concerning gender, the body-mind divide and other societal discourses.’(Höök et al. 2016b p.3302)

2.3 Identification of strategies

Amongst many, a selection of design strategies inspired by somaesthetics are here selected to display common factors, varieties and the general possibilities for diversity.

Artifacts

Perception can be mediated through artifacts, which are described as objects who attribute and extend a sensory apparatus. It has become part of the person’s body, and at the same time it has changed it (Svanæs 2013).

How to apply and use an artifact in a design process:

- The process can start with first identifying the digital material (Sundström 2011).
- Using tactility. Working with early collaborative prototyping with emphasis on device functionality and application abilities directed to the body (Schiporst 2009).
- Finding a **core experience** and focusing throughout on developing and enhancing it (Sundström 2011).
- Using experiential artifacts (experience) and inspirational bits (properties) to make an expression for the enhanced human body (Sundström 2011).

By working with an **experiential artifact**, project members from multiple backgrounds should be engaged in discussion and development of ideas, making better use of all competences. **Inspirational bits** are rough but fully working digital prototypes built to expose dynamic properties of the device. The device serves to capture, develop and communicative an experience that initially may have evolved from an identified digital material or a core experience (Sundström 2011).



Figure 2: 'The walking artifact', that detects rhythm of walking (Sundström 2011).

Research Through Design (RtD) and 'Intermediary knowledge'

By RtD, both problem and solution are attacked at the same time through the act of making. Intermediary knowledge represent the opportunities for constructing more abstracted knowledge which can not be categorised as instance or theory (Höök and Löwgren 2012).

Intermediary knowledge is collected and articulated in various forms of design exemplars which serve as 'definitions', 'facts' or as physical hypothesis, created under different contexts and are not replicable from time to another (Höök et.al 2018 and Höök 2016a). Design exemplars can be generative or evaluative (Table 1), and interplay with the two modes of working share strategical similarities to e.g. the divergence-convergence dichotomy or working with ideation versus synthesis (Höök and Löwgren 2012). Generative means that it 'can be used by other designer-researchers to create instances in different design situations'.

Generative	Evaluative
Strong concepts	Experiential qualities
Patterns	Design heuristics
Guidelines	Criticism
Methods and tools	
Annotated portfolios	

Table 1: Examples of intermediary-level knowledge design exemplars (Höök and Löwgren 2012).

Strong concepts

A particular form of generative intermediate level knowledge is called 'strong concepts', and are introduced by prof. Höök and prof. Löwgren in their paper Strong Concepts: Intermediate-Level Knowledge Interaction Design Research' from 2012.

Höök and Löwgren propose that a strong concept is distinguished by the following characteristics taken directly from teh paper(Höök and Löwgren 2012):

- It concerns the *dynamic gestalt* of an interaction design. A specific interaction experience that unfolds over time, and its interactive behaviour rather than its static appearance.
- It resides at the interface between technology and people. It is a design element, a potential part of an artefact, and at the same time, it speaks of a use practice and behaviour unfolding over time.

- It carries a core design idea which has the potential to cut across particular use situations and perhaps even application domains.
- It resides on an abstraction level above particular instances, which means that it can be realised in many different ways when it comes to interface detailing (cf. concept design vs. detailed design).

Furthermore, how a strong concept it is validated in four steps is described (Höök 2016a):

- First, the concept is identified.
- Second, a 'horizontal grounding' is performed, engaging in a comparison to what other academics have determined as strong concepts, whether it is new or already known of.
- Third, the strong concepts are filled with content to explore and analyse the possibilities, whether the concept can generate more applications. This step is also called 'vertical grounding', as we are questioning why it works, and how users might engage in the interaction.
- The final fourth step is to bring the work from previous steps into one. Is it novel, grounded and relevant? By novel, we say 'contestable' and mean whether it is new to the community. By grounded, we say 'defensible' and mean whether it has vertical and horizontal foothold. By relevant, we say 'substantive' and mean whether it has a generative purpose to the design practice (Höök 2016a).

Examples of projects by a strong concept are given in the next section of this paper.

Somatic markers (Kallio, 2003)

Kallio suggests that the reason why we may choose to use a service in the first place may be due to the 'somatic markers' inherited in them by our past experiences. Based on Antonio Damasio's neurological studies and Somatic Marker Hypotheses, aesthetics are important for our behavioural choices.

Somatic markers are described as the physiological state an image that comes to our minds invokes, and how that state will subtly urge

us in a direction for our decision making. They are affected by experiences we have had in the past and they help us to perform a subconscious automated deduction of actions (Kallio 2003). In that way, we are unknowingly and helpfully lead towards pleasurable experiences. Kallio also suggests unifying the somatic markers hypothesis with somaesthetics for the benefit of user experience.

Körper & Leib

As an adaptation of e.g Merleau-Pontys and Heideggers use of Körper and Leib, (Svanæs 2013), Mueller et.al suggest using both terms in a practical approach to designing HCI. Their paper 'Experiencing the Body as Play' named best paper award in CHI2018 suggests strategies to engage the Körper-Leib interplay in digital games and play

They propose methods where designers can change and adapt their theoretical thinking between Körper and Leib, describing various fashions of experimentation with the two perspectives. The design process reminds that we both 'are' a body and 'have' a body usually through elements of play. Körper meaning physical body, attributing also to non-animated objects and having individual functions. Leib meaning the lived body, is only attributed to humans and animals and needs to have a Körper to exist. The Leib does not have individual functions (Mueller et.al 2018a).

Movement and aesthetics

The more time and attention we are able to draw to a physical experience through our sensory instruments, we can extend our pleasure and perception of aesthetics. Uninterrupted, clean movements which compose fine detail are significant for our perception of pleasure, and these experiences can be polished and enhanced through the use of technological devices (Sundström 2011).

Similarly, Kallio argues that the success of the user experience is a matter of joy and elegance. Enjoyment equals attractiveness. Decisions are not made without emotions. We subconsciously

browse and discover our options based on their associated emotion and personal historical experiences.

According to Lee, Lim and Shusterman, the most tangible results may be in capturing and articulating movement quality (Lee, Lim and Shusterman 2014). As above mentioned, verbal articulation of movement based experiences is an ongoing challenge to the process which will take practice and time for each individual practitioner. Somatic practise can accordingly make us more aware of our presence and behaviours on a physical level through in fact challenging and thereby changing habitual behaviour and movements (Höök et.al 2016a, Bergström 2016)

Training aesthetic sensibilities with somatic awareness and reflection

We rarely question our everyday ways of moving about, and take for granted what we have learned a long time ago, which had made us able to master our own bodies. Generally, this is a good thing, but bad habits which may be causing unnecessary damage or restrictions to our bodies are also a part of this. The possibility of improving ones perceptual faculties is through better use of the soma with active engagement (Shusterman 2012). He continues that reflective body consciousness over different levels of consciousness aids learning and reforms habits and is applied by everyone who performs meliorative activities such as athletics (Shusterman 2011). The art of somatic reflection and conscious control is itself;

‘a refined intelligent habit emerging from and coordinating a background of countless other habits that constitute the developing bundle of complex, unstable, opposing attitudes, habits, impulses we call the self’(Shusterman 2008 in Höök et.al 2018)

Somatic experiences are subjective and the subject needs reflection to be able to use and learn from them, a practise which requires time, but refining the skill is simultaneous and consequent to the melioration of the product (Höök et.al 2018). It is important for artists, designers and others who are working with

aesthetic meaning to conduct somatic reflection, according to Höök et.al., to refine their skills, but also for users of the product if the goal is heightened appreciation and enrichment of bodily experiences.

A suggestive method for engaging in somatic reflection by Shusterman involves somatic introspection. It conducts an organised inward looking inquiry focusing on bodily perception and affective experiences, preferably led by an experienced practitioner(Lee, Lim and Shusterman 2014). Introspective practise as a source for learning has however gathered some comments because its strong affiliation with lower performances and rise of anxiety levels(Gallagher 2011). Simply put, Shusterman answers that reflection itself is not for the sake of measuring performances or improvement, but for the simple sake of experiencing the reflection itself and the learning brought by it.

Drawing from William James’ psychology and Feldenkrais Method, Shusterman derives that somaesthetic reflection is guided by six strategies taken out from Lee, Lim and Shusterman’s research paper titled ‘Practicing Somaesthetics: Exploring Its Impact on Interactive Product Design Ideation’ from 2014;

- Questions: Asking questions about different aspects and relations of what we perceive.
- Division into parts: Subdividing the body and directing our attention to each part, one by one.
- Contrasts of feeling: Discriminating the different feelings in one part from those in another.
- Associative interests: Making the noticing of what we are trying more precisely to feel a key to something we care about.
- Avoiding distracting interests: Warding off competing interests to what we are trying to attend to and feel.
- Pre-perception: Preparing our attention to notice what we are trying to discriminate in what we feel.

This practise showed to help participants experience and recognise unconscious movements and coordinations, which are usefully contributed to the discovery of design issues (Lee, Lim and Shusterman 2014).

Interaction Gestalt

According to Lim, interaction gestalts are dynamic and more difficult to grasp than physical gestalt because interaction is seen as the phenomenon that emerges in between people and a digital artifact. It is continuously going on and changing over time and is not tangibly located inside e.g. the artifact (Lim 2007). This relates well to Shusterman's levels of consciousness through the soma, which are also constantly and simultaneously occurring on different 'levels' over time.

The interaction gestalt is shaped by attributes that must be translated to and manifested in the artifact properties, as well as evoking the desired user experience.

Artifact properties will be described by e.g. size, texture, weight, layout, arrangement, and structure. User experience is expressed with qualities such as e.g. pleasantness, fun, ease-of-use, and affect. See Figure 3.

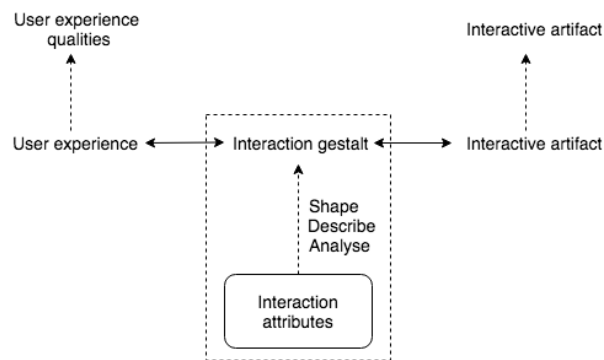


Figure 3: 'The interaction gestalt, and its relationships with user experience and interactive artifact' (Lim 2007 p.246)

In the process of examining characteristics of emerging interaction, three key factors of interaction emerged as fundamental, namely; time, space, and information. Svanæs' addition to

interaction gestalt is to describe the 'feel' dimensions (opposed to the 'look' dimension) of an experience. The interaction gestalt is the users conditional sum of felt interactions, not only based in action/reaction pairs (Svanæs 2013).

Context of design

Involving end-users is widely considered a requirement for developing user-centered design of software systems. However, developers often fail to recognise challenges in usability and appropriately involving users in the process. Svanæs and Gulliksen propose a method to involve them early on and to embrace the socio-technical system in which the design takes place, requiring early identification and analysis of relevant gaps and risk factors to the usability of the end-product. Boundary conditions in the context of design where the project takes place are key to describing the potential for the usability outreach (Svanæs and Gulliksen 2008).

When recognising the context of design, these aspects and boundary conditions may be relevant along with other initial observations:

- The relations and agendas of the organisations involved.
- Internal factors in the developer organisations.
- Software development methodology and tools.
- Maturity levels in skill and experience of developers members.
- Internal factors in the client organisations.
- Handover issues.
- Organisation sustainability.
- Lifecycle perspective.
- Conflicting requirements.

However, expecting unexpected aspects to occur during the process is accordingly relevant (Svanæs and Gulliksen 2008).

How this methodology is not far from soma-based design phenomenology is reflected in the 'introspective' method of observing the working environment, and how it is elemental for learning. The reflection is not limited to somatic standards to explore user-centered potential but includes

the socio-technical environment as the context/consciousness level.

3. PRACTITION, PROCESSES AND CONCEPTS

A mayor part of deliberate soma-based design practise has been by workshops including participants with a background in research. The goal is generally to explore potential, gather experience and build on the framework of existing knowledge (Lee, Lim and Shusterman 2014, Höök et.al 2016b and Höök et.al 2017). It should be brought to mention that most instances of soma-based design practise have probably never been documented, validated, or articulated beyond subjective experiences. Along with workshops, soma-based design is practised and documented by Kristina Höök and interaction design researchers at the Swedish Royal Institute of technology in a more ongoing fashion. On weekly frequencies engage in bodywork activities integrated in ongoing soma-based processes (Höök 2016a).

3.1 Workshops

Workshop are in many cases conducted over a period of two days, and involve a physical bodywork in combination with exploring a theme.

Along with engaging in somatic reflection, three essential steps are suggested to the workshop strategy to identify subjective experiences (Lee, Lim and Shusterman 2014):

- Training: Somatic bodywork with focus on the agenda and theme of the workshop.
- Sharing: participants may be divided into smaller teams for verbal reprocessing of experiences. A short break between the training and sharing phase may be suggested as some participants will prefer some time to make the transition. The aim is to articulate and share subjective experiences to gain useful information, and a questionnaire may be used which is targeted to making participants reflect on their experiences.

- Enacting: Ideation phase. Not all participants are as engaged in the previous part, so the enacting phase may encourage expression and outlet to ideation.

Decisions on design issues are commonly taken after performing bodywork. Then , the contestants are slowed down, feel more honest and reflective and are generally more grounded (Höök et.al. 2016b). However, directly after bodywork it can be advised to engage a smooth transit to the design process by reflecting about ones experience through conversations or taking a quick brake to filter ones expressions.

Bodywork

Common approaches to bodywork may be (but are not limited to) e.g. yoga, meditation, bodyscanning, Feldenkrais or Alexander technique, but have even been applied to horseback riding (Höök 2010 in Höök 2016b).The practise should involve momentary surrender of response patterns with the introduction of unfamiliar or forgotten sensations and movements by the bodyworker, which is the person leading the bodyworkto help immersing and share somatic experiences (Höök et. al. 2016a).

‘In order to properly learn a somatic practice like Feldenkrais and to train your (soma-)aesthetic sensitivities as a designer, it is important to be led by someone knowledgeable—or, in the words of Schiphorst: a somatic connoisseur’. (Höök et.al. 2016a)

Techniques may apply to work with somatic reflection or be based in play and experimentation (Mueller 2018b). Apart from the obvious focus on movements in soma-based design, the systems may share a playful approach in which habitual movements from our everyday life are disrupted. Accordingly, it is not directly suggested as valuable to physically bring all target users into the forum, which may in cases bring disturbance or perceived stagnation in the progress. There may be times where rather people personally or physically close

to the target users are more relevant to bring into the practise.(Höök 2018).

3.2 Integrating into projects

This section draws only two examples of soma-based design processes. One of which is conducted by the supervision of Techla Schiporst, the other by Kristina Höök.

RtA and somatic connoisseurship

As with RtD, the soma-based design may combine the act of designing with the process itself, and '[it] will drive the exploration of both problem and solutions—that is' gaining knowledge via the act of making (Bergström 2016).

Gathering and articulating intermediary knowledge is one of the challenges to soma-based design. Techla Schiporst regards touch as a primary sensory motor to our environment (Schiporst 2009), and adapts a somaesthetically inspired Research Through Art (RtA) methodology in the making of interactive art installations (see Figure 4 and 5) by exploring textiles and other physical inquiry. She introduces the concept of somatic connoisseurship in the ideation, development and prototyping stages. The framework highlights four constructs:

- Experience
- Poetics of interaction
- Materiality
- Semantics (how the system constructs meaningful behaviours from the quality of the tactile and breath input). (Schiporst, Seo and Jeffe, 2010)

By using poetic concepts for articulation, including metaphors, the process is targeting the concept of **somaesthetic markers** which can aid the creation of the user experience.



Figure 4: *soft(n)* by Techla Schiporst (Schiporst 2009)

Installation in Figure 4 displays objects connected through network to another and respond playfully to touch and movement with vibration, sound and shared pattern of light. Other installations included wearable art works 'exhale'; which garments respond to collective networked breath and 'tendrils; responds to collective touch with kinetic interaction (Schiporst, Seo and Jeffe 2010).

The strong concept 'somaesthetic appreciation design'

Somaesthetic appreciation design is a strong concept where the design aids user/designer direct focus to their somas and thereby generate somaesthetically inspired design. After identifying the strong concept and making sure it is generative, four main qualities for designing under the strong concept of somaesthetic appreciation were determined;

- Subtle guidance of attention
- Provide a space for reflection
- Creating intimate correspondence
- Encouraging articulating the experience

(Höök et.al. 2016a)

Furthermore, the designs are tested, reviewed and compared to the strong concept specifications. The process is an integration research (co-writing is encouraged), dialogue, developing design exemplars and performing bodywork and workshops through a what is characterised as a RtD process.(Höök et.al 2018)



Figure 5: Left; the 'Soma carpet' mat. Right; 'breathing lights' (Höök 2016a)

The Soma carpet (Figure 5) provides heat feedback to parts of your body which aids direction of focus to certain body parts in synchronicity with instructions to a pre-recorded Feldenkrais lesson. The breathing light detects the rhythm of your breath by movement sensors inside the enclosed lamp which will dim the ambient light accordingly.

4. DISCUSSION

Separating sections of this paper into theory and practice is not obviously intuitive to the topic, but is reflective of how scientific research is often conducted (Shusterman 2011). Many titles overlap the fields of both theory and practice, such as the concepts experiential artifacts and somatic reflection. This section of the paper resonates the pragmatic branch of the somaesthetic phenomenology, exploring specific methods of somatic improvement and their comparative critique. In this analytical paper format, it is however difficult to explore methods, but aspects of somaesthetics can be discussed.

Design strategies which share similarities with soma-base design include e.g. ACEM, slow design and design thinking, to name a few. The benefits of somaesthetics is that it may work as a general term for experiences which contribute to analytical, practical and pragmatic learning about aesthetics. One of the main strengths is that it is multidisciplinary, which highlights it from strategies distinctly directed to e.g. design. However, the outreach of the somaesthetic fundament both inwards and outwards may be

difficult to grasp and collect for beginners, but with literal practice this phenomenology holds potential.

A challenge in the field of somaesthetic design research is to articulate any kind of standardized method without losing parts of its practical and pragmatic value. The concept of a well developed soma-based design rests on the training, involvement and immersement of suitable somatic practitioners and environmental factors. A soma-based approach will never be exactly repeated twice, as is reflected in the concept definition; somatic consciousness continuously and dynamically changes over the discourse of time and levels of consciousness (Shusterman 2018b). In this aspect, method discourse must avoid too many specifications.

As mentioned before, soma-based design practice involves movement and elements of play, and there is often little distinction between the experiences explored in the process and the experiences portrayed in the end result itself. Every designer is responsible for itself, and as Shusterman puts it; by educating ourselves somatically, we are engaging in 'the highest art of all—that of living better lives' (Shusterman 2012 in Höök et.al 2018). So it is safe to say that there is potential to be explored in this framework.

4.2 Further work

A good place to start is to pay more focus and weight on subjective experiences. Arguably, an approach to a successful soma-based design process is to engage, train and understand your own soma to the fullest. To avoid delay, striving for good articulation is a priority, which can be achieved in various fashions including cowering and conducting workshops. This should not be deemed unsympathetic or inefficient, because one can not unfortunately take responsibility over someone else's subjectivity, and we rest upon each individual designers ability to train their and use their somatic reflection abilities.

It has not fully been explored in a workshop setting how awareness and environment shape our experience with interacting with an artifact, or in which circumstances to engage users, team and stakeholders, or how to conduct a commercially driven project with tangible goals has not either been documented. ‘Somatic empathy’ is also been suggested (Lee, Lim and Shusterman 2014) as a direct and meticulous pragmatic method to understand the user. Engaging empathically with user, getting to know, hanging around and mirroring a user, are techniques to solve design issues, but still hold potential for further projects in soma-based partition. Technique could include experiencing the conditions a user experiences by attempting to imitate posture, attention, anticipation and other physical interaction both going on within the user’s soma and the surroundings.

Another aspect of HCI which is sometimes neglected but important, is how already existing devices and data captured by them are shaping us (Höök et.al 2018). Soma-based design could branch out with investigative strategies on its the influence on us. Furthermore, it is possible to envision how somaesthetic design methods may possibly help us look beyond limitations of today’s HCI and create a somatically improved future.

5. CONCLUSIONS

Somaesthetics describe a phenomenological field which is used to understand and facilitate creation of pleasurable experiences. Soma-based design theory is the term which relates to the practical, pragmatic and analytical inquiry of designing through the first-person perspective of the ‘soma’, and is a well-adapted strategy to movement-based interaction design.

Increased focus on aesthetic pragmatist approaches in movement-based design and HCI hold promise for understanding the living body and how our experiences can be improved. For creating aesthetic experiences with a somaesthetic phenomenology, one must commit to the training and learning through the soma, and

not neglecting ones own bodily experiences and their validity. Results in a soma-based design process often hold their value in subjectivity and they must be recognised as such.

All approaches to soma-based research are highly relevant because the conceptual framework is based in explorative and rooted in the individuals mind frame. Keep in mind experiences need to be communicated, and therefore articulation is a central part to the soma-based development.

A soma-based design process requires a low threshold for experimentation and dynamic techniques of working. The process itself is in this perspective a part of the design, and it serves as a reminder to designers to keep it realistic, allow the development to be slow, natural and in correlation with own experiences when designing aesthetic solutions.

Regarding the results and relevance of this paper, it confirms the importance and helps identify aesthetics in user experience.

REFERENCES

- Alsos, O., Svanæs, D. (2011). *Designing for the Secondary User Experience*. Human-Computer Interaction. INTERACT :84–91
- Bergström, I., Jonsson, M. (2016). *Sarka: Sonification and Somaesthetic Appreciation Design*. In Proceedings of the 3rd International Symposium on Movement and Computing, Thessaloniki, GA, Greece, 5–6 July 2016.
- Gallagher, S. (2011). *Somaesthetics and the Care of the Body*. *Metaphilosophy*, 42(3), 305-313. doi: 10.1111/j.1467-9973.2011.01686.x
- Höök, K., Löwgren, J. (2012) *Strong Concepts: Intermediate-Level Knowledge in Interaction Design Research*. ACM Trans. Comput.-Hum. Interact. 19, 3, Article 23 (October 2012)
- Höök, K., Jonsson, M., Ståhl, A., Mercurio, J. (2016a). *Somaesthetic Appreciation Design*. Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems, ACM, 3131-3142

- Höök, K., Jonsson, M., Ståhl, A. and Tholander, J., Loke, L., Hummels, C., Klooster, S., Khut, G., Isbister, K., Marti, P., Robertson, T., Florlizzi, J., and Schiphorst, T. (2016b). *Move to be moved*. [Workshop summary] CHI2016, San Jose, CA.
- Höök, K., Hummels, C., Isbister, K., Lim, Y., Jonsson, M., Marti, P., Trotto, A., Müller, F., Petersen, M.G., Schiphorst, T., Segura, E.M., Ståhl, A., Svanæs, D. and Sanches, P., (2017). *Soma-Based Design Theory* [Workshop summary] CHI2017, Denver, CO.
- Höök, K., Caramiaux C. Cumhur Erkut, C., Forlizzi J., Hajinejad, N., Haller, M., Hummels, C. C. M., Isbister, K., Jonsson, M., Khut, G., Loke, L., Lottridge, D., Marti, P., Melcer, E., Müller, F., Petersen, M.G., Schiphorst, T., Segura, E.M., Ståhl, A., Svanæs, D., Tholander, J. and Tobiasson, A. (2018). *Embracing First-Person Perspectives in Soma-Based Design. Informatics*, 5(1), 8. doi:10.3390/informatics5010008
- Höök, Kristina. *Soma-Based Design: Reflections on a New Design Practice*. Guest lecture May 7. Guest lecture May 7, 7 May 2018, Trondheim, Øya Helsehus.
- Kallio, T. (2003). *Why We Choose the More Attractive Looking Objects - Somatic Markers and Somaesthetics in User Experience*. Proceedings of the 2003 International Conference on Designing Pleasurable Products and Interfaces - DPPI 03. doi:10.1145/782928.782934
- Lee, W., Lim, Y., Shusterman, R. (2014). *Practicing Somaesthetics: Exploring Its Impact on Interactive Product Design Ideation*. In Proceedings of the 2014 conference on Designing interactive systems (DIS '14). 1055-1064. <http://dx.doi.org/10.1145/2598510.2598561>
- Lim, Y., Stolterman, E., Jung, H., Donaldson, J. (2007). *Interaction Gestalt and Design of Aesthetic Interaction*. In Proceedings of the 2007 conference on Designing pleasurable products and interfaces (DPPI '07). 239-254. <http://dx.doi.org/10.1145/1314161.1314183>
- Merleau-Ponty, M. 1962. *Phenomenology of Perception*. Routledge & Kegan Paul, London, UK.
- Mueller, F., Byrne, R., Andres, J., Patibanda, R. (2018a). *Experiencing the Body as Play*. Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems - CHI 18. doi:10.1145/3173574.3173784
- Mueller, F., van den Hoven, E., Graham, N., Höök, K., Sas, C., Andres, J., Marshall, J., Svanæs, D., schraefel, m., Gerling, K., Tholander, J., Martin-Niedecken, A. and Segura, E. (2018b). *Body-centric computing. Interactions*, 25(4), pp.34-39.
- Schiphorst, T. (2009). *soft(n): Toward a Somaesthetics of Touch*. Proceedings of the 27th International Conference Extended Abstracts on Human Factors in Computing Systems - CHI EA 09. doi:10.1145/1520340.1520345
- Schiphorst, T., Seo, J., Jaffe, N. (2010). *Exploring Touch and Breath in Network Wearable Installation Design*. Proceedings of the International Conference on Multimedia - MM 10. doi:10.1145/1873951.1874225
- Shusterman, R. (2008) *Body Consciousness: A Philosophy of Mindfulness and Somaesthetics*. Cambridge University Press: Cambridge, UK.
- Shusterman, Richard. (2011). *Soma, Self and Society: Somaesthetics and Pragmatist Meliorism*. Blackwell Publishing Ltd
- Shusterman, R. (2012) *Thinking through the Body: Essays in Somaesthetics*. Cambridge University Press.
- Shusterman, Richard. (2018a) 'Somaesthetics'. *Encyclopedia of Human-Computer Interaction, 2nd Ed. Soegaard, Mads, and Rikke Friis Dam*. Available at: <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/somaesthetics> [Accessed 11 Oct. 2018].
- Shusterman, Richard. (2018b) *Somaesthetics and Design*. Guest lecture May 7. Guest lecture May 7, 7 May 2018, Trondheim, Øya Helsehus.
- Sundström, P., Vaara, E., Solsona, J., Wirstrom, N., Lundén, M., Laaksohathi, J., Waern, A., Höök, K. (2011). *Experimental Artifacts as a Design Method for Somaesthetic Service Development*. Proceedings of the 2011 ACM Symposium on The Role of Design in UbiComp Research & Practice - RDURP 11. doi:10.1145/2030031.2030041
- Svanæs, D., Gulliksen, Jan (2008). *Understanding the Context of Design - Towards Tactical User Centered Design*. Proceedings of the 5th Nordic Conference on Human-computer Interaction Building Bridges - NordiCHI 08. doi:10.1145/1463160.1463199
- Svanæs, D. (2013). *Interaction Design for and with the Lived Body: Some Implications of Merleau-Ponty's Phenomenology*. *ACM Transactions on Computer-Human Interaction*, 20(1), 1-30. doi:10.1145/2442106.2442114